

WHAT IS CLAIMED IS:

1 *Sub 1* 1. An elongated truss boom adapted to be flattened and coiled to a stowed  
2 configuration comprising:

3 a plurality of longerons arranged parallel to and equidistant from a longitudinal axis  
4 of the truss boom forming a polygonal cross section normal to the longitudinal axis;

5 a plurality of fixed battens; and

6 a plurality of moveable battens;

7 wherein the fixed battens and the moveable battens are coupled to the longerons to  
8 form a plurality of polygonal frame members which are located in a series of planes normal  
9 to the longitudinal axis; and

10 wherein the fixed battens interconnect the longerons to form two opposing rigid  
11 ladder shaped structures which are moveably connected by movable battens.

12 ✓ 2. An elongated truss boom as claimed in claim 1, wherein the moveable battens  
1 are fully extended and the ladder shaped structures are separated when the truss boom is  
2 extended, and the moveable battens are closed and the ladder shaped structures are together  
3 such that the longerons are substantially coplanar when the truss boom is stowed.  
4

1 ✓ 3. An elongated truss boom as claimed in claim 2, further comprising a plurality of  
2 diagonals that interconnect adjacent polygonal frame members.

1 ✓ 4. An elongated truss boom as claimed in claim 1, wherein the longerons have a  
2 corrugated cross section.

cmf. Ar  
2 ✓ 5. An elongated truss boom as claimed in claim 4; wherein the corrugated cross  
section is "L" shaped.

1 ✓ 6. An elongated truss boom as claimed in claim 1, wherein four longerons are  
2 arranged in a square polygonal cross section.

1 7. An elongated truss boom as claimed in claim 1, further comprising a self  
2 actuation means which biases the moveably coupled battens and the truss boom in an  
3 expanded position.

1 ✓ 8. An elongated truss boom as claimed in claim 1, further comprising a  
2 mechanically actuated locking means which releases the truss boom for stowage and locks  
3 the deployed truss boom in an expanded configuration.

1 9. A mechanical assembly machine for deploying a truss boom comprising:

2 a drum;

3 a stowed flattened truss boom rolled into a coil around the drum; and

4 a means for unrolling the coil.

10. A mechanical assembly machine as claimed in claim 9, further comprising:

an actuating and locking mechanism which holds a leading edge of the truss boom  
and includes an upper plate, a lower plate, diagonal tensioners, and oscillating longeron  
clamps; and

a control arm which connects the actuating and locking mechanism to the drum;

wherein the actuating and locking mechanism deploys a mechanically actuated truss  
boom by feeding out the leading edge and then mechanically expanding and locking the  
truss boom while the truss boom is unrolled.

11. A mechanical assembly machine as claimed in claim 10, wherein the actuating  
and locking mechanism includes a heating means, and the heating means restores a truss  
boom having longerons which have been flattened to a ribbon shape for stowage to their  
original corrugated cross section during deployment.

1           12. A mechanical assembly machine as claimed in claim 11, wherein the heating  
2 means straightens a truss boom having longerons with folded expansion joints during  
3 deployment.

cent.  
Ad  
1           13. A method for stowing an elongated truss boom comprising:  
2 compressing the truss boom laterally into an elongated flat structure;  
3 rolling the flat structure into a coil; and  
4 unrolling and expanding the truss boom into an elongated three dimensional  
5 structure.

1           14. The method for stowing an elongated truss boom as claimed in claim 13,  
2 further comprising:  
3 heating a truss boom having longerons which have been flattened to a ribbon shape  
4 for stowage to restore their original corrugated cross section during deployment.

1           15. The method for stowing an elongated truss boom as claimed in claim 13,  
2 further comprising:  
3 heating a truss boom having longerons with folded expansion joints to straighten  
4 the longerons during deployment.

add as

Docket No.: N.C. 80,124

Inventor's Name: Michael A. Brown et al.

PATENT APPLICATION